MITSUBISHI

A985GOT-TBA/TBD(-V)

User's Manual

(Hardware)

Thank you for buying the MELSEC-GOT Series

Prior to use, please read both this manual and detailed manual thoroughly and familiarize yourself with the product.

MODEL	A985GOT-U(H/W)
MODEL CODE	1DM105
IB(NA)-80019-G(0408)MEE	

● SAFETY PRECAUTIONS ●

(Always read these instructions before using this equipment.)

Before using this product, please read this manual and the relevant manuals introduced in this manual carefully and pay full attention to safety to handle the product correctly.
Precautionary notes in this manual cover only the installation of this product. For safety precautions on the PLC system, refer to the CPU User's Manual.
In this manual, the safety instructions are ranked as "DANGER" and "CAUTION".

⚠DANGER	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage.

Note that the **⚠CAUTION** level may lead to a serious consequence according to the circumstances.
Always follow the instructions of both levels because they are important to personal safety.
Please save this manual to make it accessible when required and always forward it to the end user.

[DESIGN PRECAUTIONS]

⚠DANGER

- Some failures of the GOT main unit, communication module, communication board or cable may keep the outputs on or off.
  An external monitoring circuit should be provided to check for output signals which may lead to a serious accident.
  Not doing so can cause an accident due to false output or malfunction.
- If a communication fault (including cable disconnection) occurs during monitoring on the GOT, communication between the GOT and PLC CPU is suspended and the GOT becomes inoperative.
  For bus connection: The CPU becomes faulty and the GOT inoperative.
  For other than bus connection: The GOT becomes inoperative.
  A system where the GOT is used should be configured to perform any significant operation to the system by using the switches of a device other than the GOT on the assumption that a GOT communication fault will occur.
  Not doing so can cause an accident due to false output or malfunction.

[DESIGN PRECAUTIONS]

⚠DANGER

- Do not use the GOT as the warning device that may cause a serious accident.
  An independent and redundant hardware or mechanical interlock is required to configure the device that displays and outputs serious warning.
  Failure to observe this instruction may result in an accident due to incorrect output or malfunction.
- Incorrect operation of the touch switch(s) may lead to a serious accident if the GOT backlight is gone out.
  When the GOT backlight goes out, the display section turns black and causes the monitor screen to appear blank, while the input of the touch switch(s) still remains active.
  This may confuse an operator in thinking that the GOT is in “screensaver” mode, who then tries to release the GOT from this mode by touching the display section, which may cause a touch switch to operate.
  Note that the following occurs on the GOT when the backlight goes out.
  - The monitor screen disappears even when the screensaver is not set.
  - The monitor screen will not come back on by touching the display section, even if the screensaver is set.

⚠CAUTION

- Do not bundle the control and communication cables with main-circuit, power or other wiring. Run the above cables separately from such wiring and keep them a minimum of 100mm apart.
  Not doing so noise can cause a malfunction.

[MOUNTING PRECAUTIONS]

⚠DANGER

- Before installing or removing the GOT main unit to or from an enclosure, always switch off the GOT power externally in all phases. Not doing so can cause a module failure or malfunction.
- Before loading or unloading the communication board, communication module, External I/O module or memory board to or from the GOT, always switch off the GOT power externally in all phases. Not doing so can cause a module failure or malfunction.

⚠CAUTION

- The GOT should be used in the environment given in the general specifications of this user's manual. Not doing so can cause an electric shock, fire, malfunction or product damage or deterioration.
- When mounting the GOT main unit to an enclosure, tighten the mounting screws in the specified torque range. Undertightening can cause a drop, short circuit or malfunction. Overtightening can cause a drop, short circuit or malfunction due to the damage of the screws or module.
- When loading the communication board, communication module or External I/O module to the GOT main unit, fit it to the connection interface of the GOT and tighten the mounting screws in the specified torque range. Undertightening can cause a drop, failure or malfunction. Overtightening can cause a drop, failure or malfunction due to the damage of the screws or module.
- When loading the memory board into the GOT main unit, load it into its corresponding GOT slot and tighten the mounting screws in the specified torque range. Undertightening can cause a malfunction due to a contact fault. Overtightening can cause a malfunction due to the damage of the screws or module.
- When loading the PC card into the GOT main unit, insert and push it into its corresponding GOT slot until the PC card eject button comes up. Not doing so can cause a malfunction due to a contact fault.
- Before loading or unloading the PC card to or from the GOT, set the memory card access switch to the OFF position. Not doing so can cause the PC card data to be corrupted.

[WIRING PRECAUTIONS]

⚠DANGER

- Before starting wiring, always switch off the GOT power externally in all phases.
  Not doing so may cause an electric shock, product damage or malfunction.

⚠CAUTION

- Please make sure to ground FG terminal, LG terminal, and protective ground terminal of the GOT power supply unit by applying Class D Grounding (Class 3 Grounding Method) or higher which is used exclusively for the GOT.
  Not doing so may cause an electric shock or malfunction.
- Correctly wire the power supply module on the GOT after confirming the rated voltage and terminal arrangement of the product.
  Not doing so can cause a fire or failure.
- Tighten the terminal screws of the GOT power supply section in the specified torque range.
  Undertightening can cause a short circuit or malfunction.
  Overtightening can cause a short circuit or malfunction due to the damage of the screws or module.
- Exercise care to avoid foreign matter such as chips and wire offcuts entering the module.
  Not doing so can cause a fire, failure or malfunction.
- Plug the bus connection cable by inserting it into the connector of the connected module until it "clicks".
  After plugging, check that it has been inserted snugly.
  Not doing so can cause a malfunction due to a contact fault.
- Plug the communication cable into the connector of the connected module and tighten the mounting and terminal screws in the specified torque range.
  Undertightening can cause a short circuit or malfunction.
  Overtightening can cause a short circuit or malfunction due to the damage of the screws or module.

[TEST OPERATION PRECAUTIONS]

DANGER

- Before performing test operation (bit device on/off, word device's present value changing, timer/counter's set value and present value changing, buffer memory's present value changing) for a user-created monitor screen, system monitoring, special module monitoring or ladder monitoring, read the manual carefully to fully understand how to operate the equipment. During test operation, never change the data of the devices which are used to perform significant operation for the system.
  False output or malfunction can cause an accident.

[STARTUP/MAINTENANCE PRECAUTIONS]

DANGER

- When power is on, do not touch the terminals.
  Doing so can cause an electric shock or malfunction.
- Before starting cleaning or terminal screw retightening, always switch off the power externally in all phases.
  Not switching the power off in all phases can cause a module failure or malfunction.
  Undertightening can cause a short circuit or malfunction.
  Overtightening can cause a short circuit or malfunction due to the damage of the screws or module.

CAUTION

- Do not disassemble or modify the module.
  Doing so can cause a failure, malfunction, injury or fire.
- Do not touch the conductive and electronic parts of the module directly.
  Doing so can cause a module malfunction or failure.
- The cables connected to the module must be run in ducts or clamped.
  Not doing so can cause the module or cable to be damaged due to the dangling, motion or accidental pulling of the cables or can cause a malfunction due to a cable connection fault.
- When unplugging the cable connected to the module, do not hold and pull the cable portion.
  Doing so can cause the module or cable to be damaged or can cause a malfunction due to a cable connection fault.

[BACKLIGHT CHANGING PRECAUTIONS]

DANGER

- Before changing the backlight, always switch off the GOT power externally in all phases (when the GOT is connected to the bus, the PLC CPU power must also be switched off externally in all phases) and remove the GOT main unit from the enclosure.
  Not switching the power off in all phases may cause an electric shock.
  Not removing the unit from the enclosure can cause injury due to a drop.

CAUTION

- While changing the backlight, do not touch the circuit boards and electronic parts of the GOT.
  Doing so can cause a failure or malfunction.
- When changing the backlight, always note the following.
  - Wear gloves or fingerstalls before starting the replacement of the backlight.
    Not doing so can cause injury.
  - Start changing the backlight more than 5 minutes after switching the GOT power off.
    Not doing so can cause a burn due to the heat of the backlight.

[DISPOSAL PRECAUTIONS]

CAUTION

- When disposing of the product, handle it as industrial waste.

Revisions

*The manual number is given on the bottom right of the top cover.

Print Date	*Manual Number	Revision
Dec, 1998	IB(NA)-80019-A	First edition
Nov., 2000	IB(NA)-80019-B	Partial correction Section3.1, Section 5.1, Section 5.2 Partial addition Chapter 1, Section 2.1, Section 3.2, Section3.3, Chapter 4 Addition Section 2.2, Section 3.5, Section 3.6, Appendix 2 Models added A985GOT-TBA-V, A985GOT-TBD-V
Feb., 2001	IB(NA)-80019-C	Partial addition Section3.5, Section3.6
Feb., 2002	IB(NA)-80019-D	Partial correction SAFETY PRECAUTIONS
Aug., 2003	IB(NA)-80019-E	Correction for A985GOT-TBA and A985GOT-TBD due to new support of commercially-available flash PC cards.
Jun., 2004	IB(NA)-80019-F	Partial correction Section 3.4, Section 3.5, Section 3.6 Partial addition Chapter 1, Section 2.2, Appendix 2 Addition Section 2.1, Section 3.2, Section 5.4
Aug., 2004	IB(NA)-80019-G	Addition Section 5.4, 5.5, 5.6 Partial correction About the Manuals, Section 3.3, Section 5.7 corresponds to the former Section 5.4. MODEL CODE change Changed from 13JQ15 to 1DM105

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About the Manuals

The following manuals are related to this product.
Refer to the following list and request the required manuals.

Detailed Manual

Manual name	Manual No. (Model code)
A985GOT/A975GOT/A970GOT/A960GOT User's Manual (Available as an Option)	SH-4005 (1DM099)

Relevant Manuals

For relevant manuals, refer to the PDF manual stored within the drawing software.

1. Overview

This user's manual describes the system configuration, specifications, part names, handling and outline dimension of the A985GOT-TBA/TBD(-V) (Referred to as GOT, hereafter).

The following GOT types are available.

Item	Type	Remarks
A985GOT-V	A985GOT-TBA-V	Video/RGB display function supports*, 100AC to 240V
	A985GOT-TBD-V	Video/RGB display function supports*, 24VDC
A985GOT	A985GOT-TBA	Built-in CRT interface,100AC to 240V
	A985GOT-TBD	Built-in CRT interface,24VDC

* The option unit should be prepared for Video/RGB input.
This manual explains the GOT of function version B.
For specifications of GOT of function version A or earlier, refer to A985GOT/A975GOT/A970GOT/A960GOT User's Manual.

1.1 Packing List

After unpacking, confirm that you have received the following products.

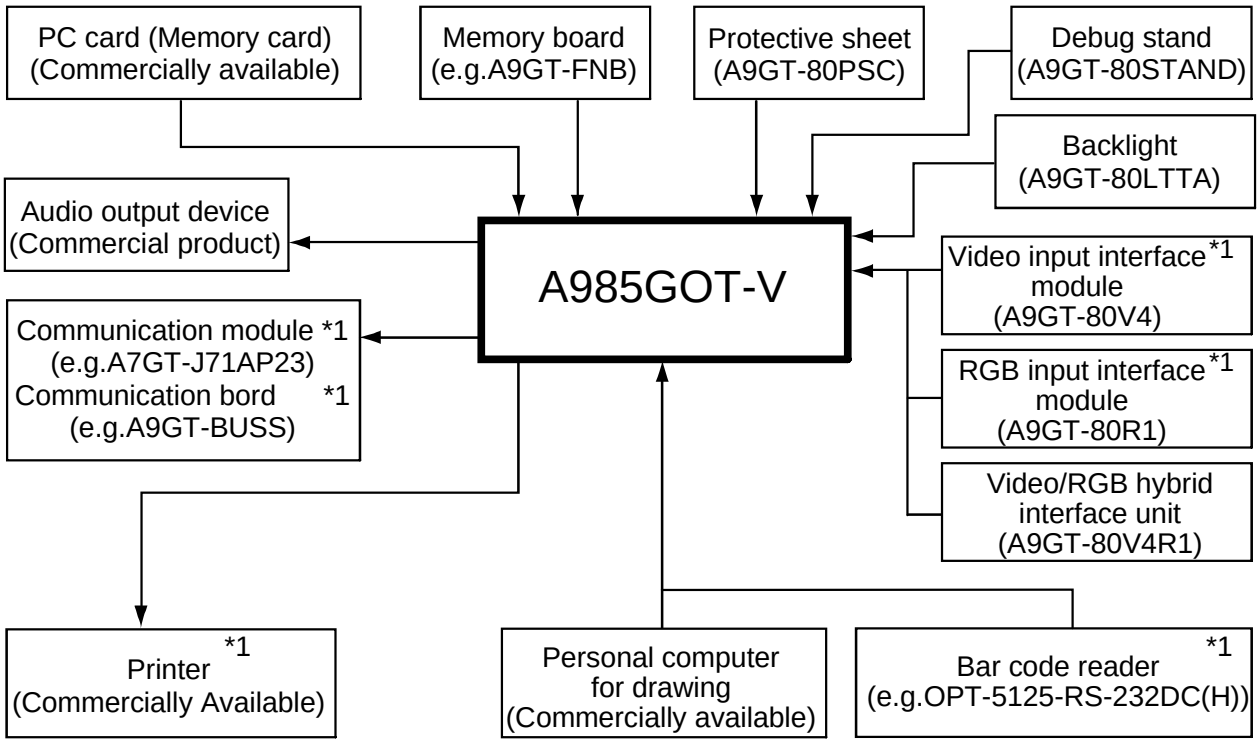
Product	Quantity
GOT main unit	1
Mounting fixture	4
Communication unit securing fixture	3

* If the protective sheet needs to be replaced, please obtain the one that is to be purchased separately.

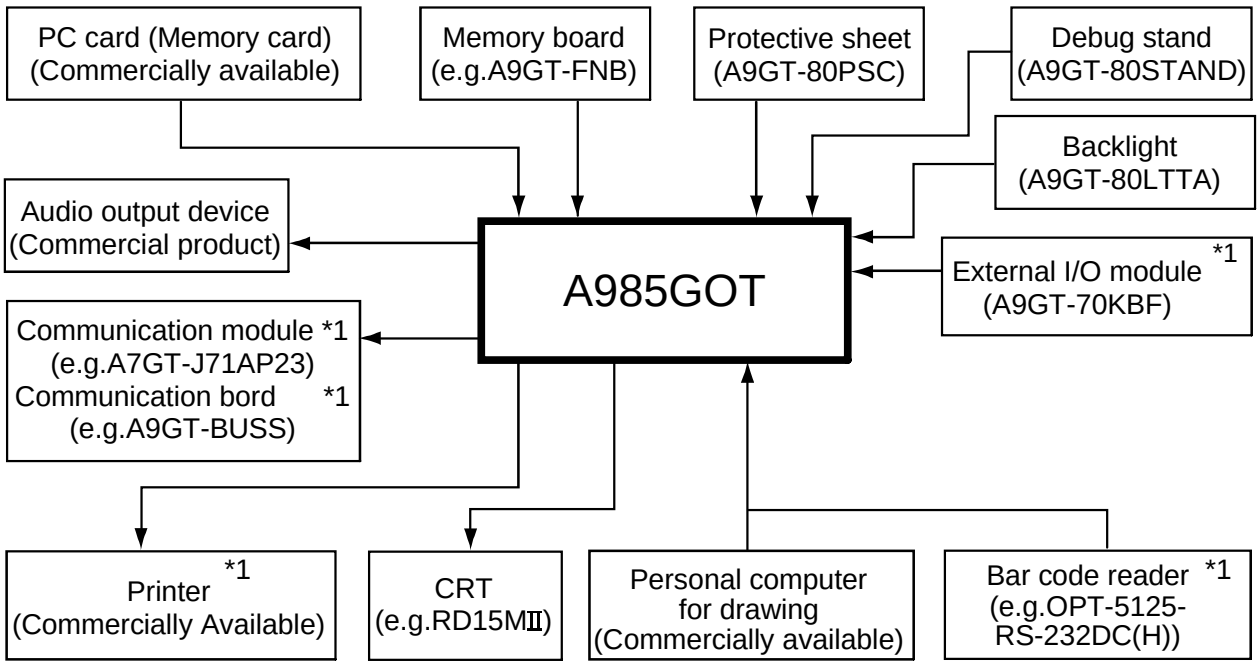
2. System Configuration

2.1 Overall configuration

(1) For A985GOT-V



(2) For A985GOT



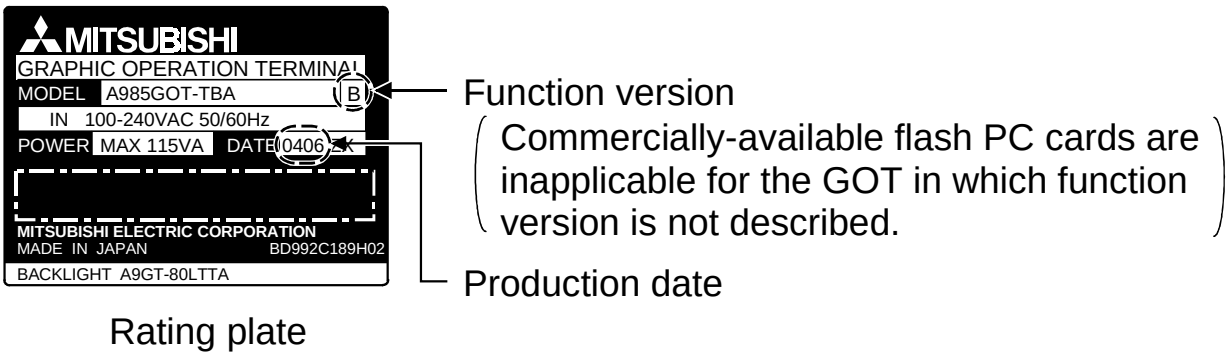
*1 For details of the system configuration, refer to the [GOT-A900 Series User's Manual (Connection System Manual)].

2.2 Component List

Item	Type	Remarks
A985GOT-V	A985GOT-TBA-V	Video/RGB display function support, built-in 100 to 240 VAC power supply
	A985GOT-TBD-V	Video/RGB display function support, built-in 24 VDC power supply
A985GOT	A985GOT-TBA	Built-in CRT interface, built-in 100 to 240 VAC power supply
	A985GOT-TBD	Built-in CRT interface, built-in 24 VDC power supply
Backlight	A9GT-80LTTA	Backlight for A985GOT(-V)
Debug stand	A9GT-80STAND	Debug stand for A985GOT(-V)
Protective sheet	A9GT-80PSC	Transparent protective sheet for A985GOT(-V)
Bus Connection board	A9GT-QBUSS	For bus connection, small connector type (For QCPU (Q mode))
	A9GT-BUSS	For bus connection, small connector type (For A/QnA/Motion controller CPU)
	A9GT-QBUS2S	For Multi-drop bus connection, small connector type (For QCPU (Q mode))
	A9GT-BUS2S	For Multi-drop bus connection, small connector type (For A/QnA/Motion controller CPU)
Bus Connection unit	A9GT-BUSSU	For bus connection, small connector type (For A/QnA/Motion controller CPU)
	A9GT-BUS2SU	For Multi-drop bus connection, small connector type (For A/QnA/Motion controller CPU)
Serial Communication board	A9GT-RS2	Direct connection to CPU/ Computer link connection/ Microcomputer connection and RS-232C connection (Without clock function)
	A9GT-RS4	Direct connection to CPU/ Computer link connection/ Microcomputer connection and RS-422 connection (Without clock function)
	A9GT-RS2T	Direct connection to CPU/ Computer link connection/ Microcomputer connection and RS-232C connection (Incorporating clock function)
Data link unit	A7GT-J71AP23	For MELSECNET(II) optical link connection
	A7GT-J71AR23	For MELSECNET(II) coaxial link connection
	A7GT-J71AT23B	For MELSECNET/B connection
Network unit	A7GT-J71LP23	For MELSECNET/10 optical loop network connection
	A7GT-J71BR13	For MELSECNET/10 coaxial bus network connection
Control Communication link (CC-Link) unit	A8GT-J61BT13	For CC-Link connection, for use as inteligent device station
	A8GT-J61BT15	For CC-Link connection, for use as remort device station
Ethernet Communication unit	A9GT-J71E71-T	For Ethernet connection
External I/O unit	A9GT-70KBF	For external I/O connection (Can be used only with A985GOT)
Video input interface unit	A9GT-80V4	For video input equipment connection (Can be used only with A985GOT-V)
RGB input interface unit	A9GT-80R1	For personal computer connection (Can be used only with A985GOT-V)
Video/RGB hybrid interface unit	A9GT-80V4R1	For video camera/personal computer connection (Can be used only with A985GOT-V)

Item	Type	Remarks
PC card	-	Commercially available SRAM type PC card (Compliant with PCMCIA Ver.2.1 or later.)
	-	Commercially available Compact Flash PC card*1 (Compliant with FlashTM*2)
	A9GTMEM-10MF	For GOT, Memory 16M byte (Hardware version D or later), flash PC card*3
	A9GTMEM-20MF	For GOT, Memory 32M byte (Hardware version D or later), flash PC card*3
	A9GTMEM-40MF	For GOT, Memory 64M byte (Hardware version D or later), flash PC card*3
Memory board	A9GT-FNB	Exclusively used for optional function OS storage
	A9GT-FNB1M	For optional function OS storage + expansion memory, 1M byte
	A9GT-FNB2M	For optional function OS storage + expansion memory, 2M byte
	A9GT-FNB4M	For optional function OS storage + expansion memory, 4M byte
	A9GT-FNB8M	For optional function OS storage + expansion memory, 8M byte
	A9GT-QFNB	Exclusively used for optional function OS storage
	A9GT-QFNB4M	For optional function OS storage + expansion memory, 4M byte
	A9GT-QFNB8M	For optional function OS storage + expansion memory, 8M byte
Bus extension connector box	A9GT-QCNB	Used for connection of the QCPU (Q mode) long-distance bus
Bus connector conversion box	A7GT-CNB	For conversion from large type connector to small type connector (Used for connection of the A/Q A/Motion controller CPU long-distance bus)
Printer	-	Printer compliant with ESC/P24-J84 (ESC/P command compatible)
		Hewlett Packard Printers (PLC command compatible)
Printer cable	AC30PIO-20P	Cable length3.0m

*1 Commercially-available flash PC cards are applicable for A985GOT-V or A985GOT of which function version A or later.
The GOT version is located on the rating plate at the rear of the GOT.


MITSUBISHI
GRAPHIC OPERATION TERMINAL
MODEL A985GOT-TBA B
IN 100-240VAC 50/60Hz
POWER MAX 115VA DATE 0406
MITSUBISHI ELECTRIC CORPORATION
MADE IN JAPAN BD992C189H02
BACKLIGHT A9GT-80LTTA
Function version
Commercially-available flash PC cards are inapplicable for the GOT in which function version is not described.
Production date

Rating plate

*2 Compact Flash TM is a trademark of Sundisk.
*3 The flash PC card's memory capacity varies according to the hardware version.
The memory capacity can be checked from the rating plate.

3. Specifications

3.1 General Specifications

<table>
<tr><th>Item</th><th colspan="6">Specifications</th></tr>
<tr><td rowspan="2">Operating ambient temperature</td><td colspan="3">Display section</td><td colspan="3">0 to 40°C</td></tr>
<tr><td colspan="3">Other than display section</td><td colspan="3">0 to 55°C</td></tr>
<tr><td>Storage ambient temperature</td><td colspan="6">–20 to 60°C</td></tr>
<tr><td>Operating ambient humidity</td><td colspan="6">10 to 90%RH, non-condensing</td></tr>
<tr><td>Storage ambient humidity</td><td colspan="6">10 to 90%RH, non-condensing</td></tr>
<tr><td rowspan="5">Vibration resistance</td><td rowspan="5">Conforms to JIS B3502 and IEC 61131-2.</td><td></td><td>Frequency</td><td>Acceleration</td><td>Amplitude</td><td>Sweep Count</td></tr>
<tr><td rowspan="2">In case of intermittent vibration</td><td>10 to 57Hz</td><td>—</td><td>0.075mm</td><td rowspan="4">10 times in each of X, Y and Z directions (for 80 minutes)</td></tr>
<tr><td>57 to 150Hz</td><td>9.8m/s^2</td><td>—</td></tr>
<tr><td rowspan="2">In case of continuous vibration</td><td>10 to 57Hz</td><td>—</td><td>0.035mm</td></tr>
<tr><td>57 to 150Hz</td><td>4.9m/s^2</td><td>—</td></tr>
<tr><td>Shock resistance</td><td colspan="6">Conforms to JIS B3502 and IEC 61131-2
(147m/s^2, 3 times in each of X, Y and Z directions)</td></tr>
<tr><td>Operating atmosphere</td><td colspan="6">No corrosive gas</td></tr>
<tr><td>Operating altitude *1</td><td colspan="6">2000m max.</td></tr>
<tr><td>Installation site</td><td colspan="6">Inside control box</td></tr>
<tr><td>Overvoltage category *2</td><td colspan="6">II or less</td></tr>
<tr><td>Contamination level *3</td><td colspan="6">2 or less</td></tr>
</table>

*1 Please do not use or store GOT in an environment with atmospheric pressure greater than the atmospheric pressure at sea level (0m). Failure to do so may cause a malfunction.

*2 Indicates the element in the distribution system between the public electricity grid and the mechanical equipment inside the premises that the relevant device is assumed to be connected to.
Category II applies to devices such as those that draw their power supply from fixed installations.
The surge voltage withstand capability of devices with ratings up to 300V is 2,500V.

*3 This index gives a measure of the incidence of conductive materials in the environment in which the device is used.
A contamination level of 2 indicates an environment in which there is only contamination by non-conducting materials, but due to occasional condensation, conductivity may occur.

3.2 Performance specifications

Item		Specifications	
		A985GOT-TBA-V A985GOT-TBD-V	A985GOT-TBA A985GOT-TBD
Display section	Type	High-intensity TFT color liquid crystal (Intensity: 350 candela)	
	Resolution [dots]	800 × 600	
	Display size [mm] (inch)	246 (9.69) × 184.5 (7.26)	
	Display color [color]	256	
	Image display color [color]	65536	-
	Intensity	350cd/m^2 (Average intensity of liquid crystal only.)	
	View angle	60 degrees (right and left), 40 degrees (up), 50 degrees (down)	
Human sensor	Detection length [m] (inch)	1 (39.37)	
	Detection range	70°each in top/bottom, left/right directions	
	Detection delay time [sec.]	0 to 4	
CRT interface		-	For CRT connection, SVGA 1 channel
Option unit interface*1		1 channel for video/RGB composite unit attachment	1 channel for external I/O interface unit attachment
Backlight		Cold cathode fluorescent tube backlight (Backlight OFF/screen saving time/operator detect sensor setting allowed)	
Life*2	Display section [Hr]*3*4	50,000 (Operating ambient temperature: 25°C)	
	Backlight [Hr]	50,000 (Time when display luminance reaches 50% at the operating ambient temperature of 25°C)	
	Touch key	1 million times or more (operating force 100g max.)	
	Built-in memory	Number of write times: 100,000 times	
Environmental protective structure		Equivalent to IP65 (front section)	
External dimensions [mm] (inch)		312 (12.28) (W) × 238 (9.37) (H) × 49 (1.93) (D)	
Panel cutting dimensions [mm] (inch)		302 (11.89) (W) × 228 (8.98) (H)	
Weight [kg](lb)		A985GOT-TBA-V: 2.33 (5.13) A985GOT-TBD-V: 2.28 (5.02)	A985GOT-TBA: 2.35 (5.17) A985GOT-TBD: 2.30 (5.06)
Compatible software package		F version of SW5D5C-GTWORKS-E or later F version of SW5D5C-GOTR-PACKE or later	A version of SW0D5C-GTWORKS-E or later C version of SW1D5C-GOTR-PACKE or later

*1 The option unit that can be mounted to the option unit interface differs according to the GOT used.
Note that units other than listed below cannot be mounted to the option unit interface.

GOT being used	Option unit that can be mounted on
A985GOT-V	A9GT-80V4 (Video input interface unit)
	A9GT-80R1 (RGB input interface unit)
	A9GT-80V4R1 (Video/RGB hybrid interface unit)
A985GOT	A9GT-70KBF (External I/O interface unit)

*2 When parts must be changed, consult your sales representative.
*3 The screen saving/back light OFF function of GOT is extended, thus reducing burning prevention of the display panel and extending longevity of the back light.
*4 Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements.
Please note that these dots appear due to its characteristic and are not caused by product defect.

3.3 Power supply specifications

Item	Specifications		
	A985GOT-TBA(-V)		A985GOT-TBD(-V)
Input power supply voltage	100AC to 240V (+10%,-15%)		24VDC (+25%,-20%)
Input frequency [Hz]	50/60 ± 3		—
Input max. apparent power	Using 100VAC Communication board loaded: 59VA or less Communication module loaded: 69VA or less *1 Using 200VAC Communication board loaded: 74VA or less Communication module loaded: 86VA or less *1	Using 100VAC Communication board loaded: 50VA or less Communication module loaded: 60VA or less *1 Using 200VAC Communication board loaded: 63VA or less Communication module loaded: 75VA or less *1	—
Power consumption [W]	40		
Inrush current [A]	40 max. (264VAC, max. load)		61 max. (30VDC, max. load)
Permissible instantaneous power failure time [ms]	20 (100VAC or more)		1 (19.2VDC or more)
Noise immunity	By noise simulator of 1,500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency		By noise simulator of 500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency
Dielectric withstand voltage	1500VAC for 1 minute across AC external terminals and earth		500VAC for 1 minute across DC external terminals and earth
Insulation resistance	10MΩ or larger by insulation resistance tester		
Applicable wire size [mm^2]	0.75 to 2		
Applicable solderless terminal	RAV1.25–3, V2–S3.3, V2-N3A, FV2-N3A		
Applicable tightening torque [N•cm] (Terminal block terminal screw)	59 to 88 N•cm		
External output	Refer to *2		

*1: When the communication module for bus connection (A9GT-BUSSU/A9GT-BUS2SU/A9GT-QBUS2SU) is loaded, this value is equivalent to the input max. apparent power value when the communication board is loaded.

*2: For external outputs please refer to the [A985GOT/A975GOT/A970GOT/A960GOT User's Manual] that is to be purchased separately.

Remarks

Note that the power is reset if an instantaneous power failure occurs. However, if the instantaneous power failure is within 20ms when using 100 to 240VAC, or within 1ms when using 24VDC, the operation will be normal.

3.4 Human sensor

The human sensor mounted in the A985GOT(-V) body, can detect operators in the sensor detection area and turn the backlight ON and OFF automatically. Refer to the [GOT-A900 Series Operating Manual (Extended • Option Functions Manual)] for details on setting the human sensor.

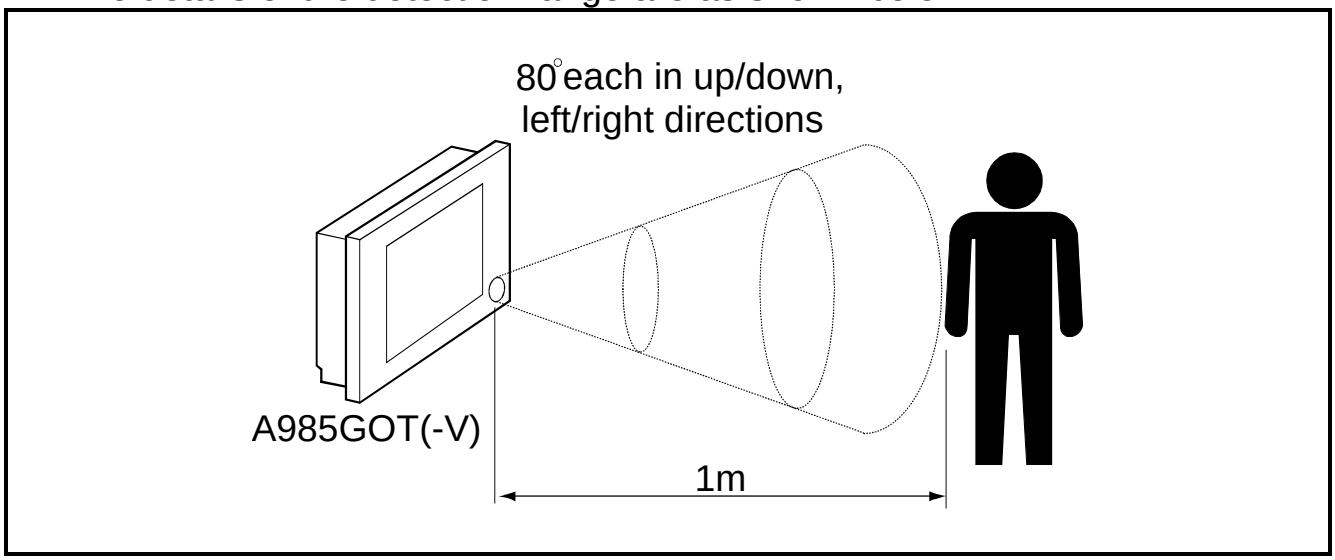
(1) Detection range

The performance of the human sensor is shown below.

Item		Description	Conditions
Detection length [m] (inch)		1 (39.37)	1. The temperature difference from the background must be 3±1°C or more. 2. The movement speed is 0.3 to 2.0m/s.
Detection range	Up/down	80°	
	Left/right	80°	
Detection delay time [sec.]		0 to 4	

* Note that the human sensor may react even under conditions that those above.

The details of the detection range are as shown below.



(2) Precautions for using human sensor

* If there is glass or acrylic in the sensor detection area, it cannot be penetrated to detect a human even if it is transparent.
* The human sensor may not function correctly in places where sudden temperature changes occur such as near the blow-off port of air conditioners.
* The human sensor may not function correctly in places where the sensor section is subject to direct sun rays.

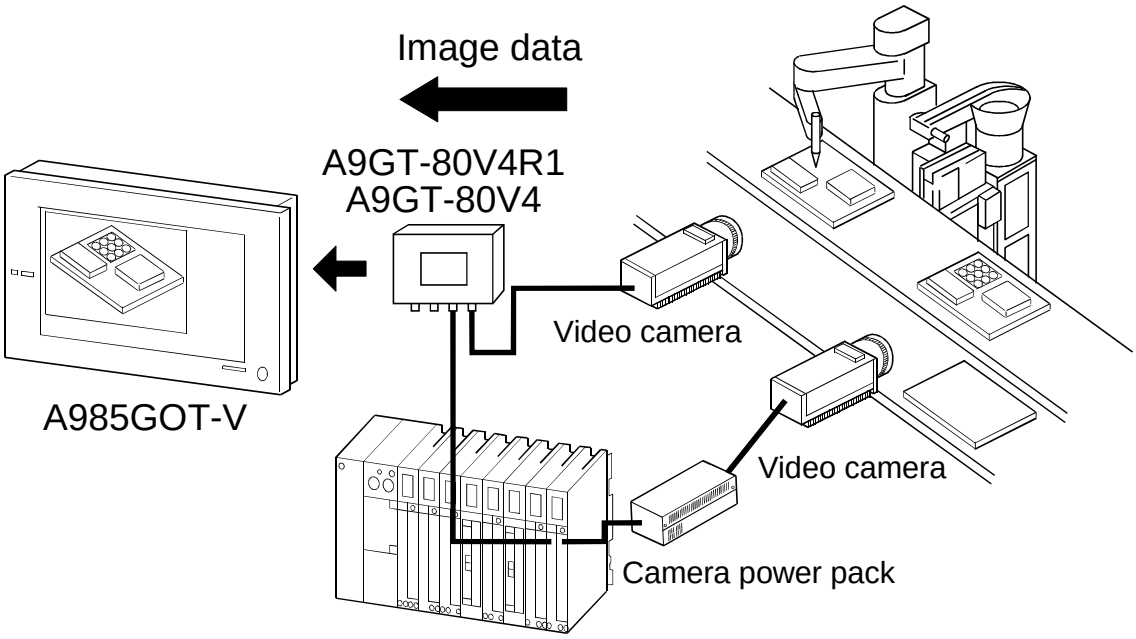
3.5 Video Input (only for A985GOT-V)

By mounting a video/RGB hybrid interface unit (A9GT-80V4R1) or video input interface unit (A9GT-80V4) to the A985GOT-V, images taken by video cameras can be displayed on the video window of the A985GOT-V.
It is possible to use the A985GOT-V as a vision sensor monitor.
For details of the video window, refer to the following manual.

- For GT Designer : GT Works Version□/GT Designer Version□ Reference Manual
- For GT Designer2 : GT Designer2 Version□ Reference Manual

For details of the system configuration, refer to the following manual.

- GOT-A900 Series User's Manual (Connection System Manual)



Vision sensor (AS50VS or other)

The camera power pack may be necessary depending on the vision sensor used.

(1) Video display specifications

Item		Specifications
Image display color (color)		65536
Video input format	Color	NTSC format, PAL format (interlaced format)
	Monochrome*1	EIA format, CCIR format (interlaced format)
Number of video input channels		4 channels
Display size (mm)		640 x 480 (can be reduced to 320 x 240, 160 x 120) 720 x 480 (can be reduced to 360 x 240, 180 x 120)

*1 EIA format is the monochrome specification of the NTSC format.
CCIR format is the monochrome specification of the PAL format.

- For details of the system configuration, refer to the GOT-A900 Series User's Manual (Connection System Manual).
- For details of the video window, refer to the following manual.
  For GT Designer : GT Works Version□/GT Designer Version□ Reference Manual
  For GT Designer2 : GT Designer2 Version□ Reference Manual
- One of the following software package are required for A9GT-80V4, A9GT-80V4R1:

Type	Compatible software package	
	GT Works2 GT Designer2	GT Works GT Designer
A9GT-80V4R1	SW1D5C-GTWK2-E version A or later SW1D5C-GTD2-E version A or later	SW5D5C-GTWORKS-E version 26C or later SW5D5C-GOTR-PACKE version 26C or later
A9GT-80V4		SW5D5C-GTWORKS-E version F or later SW5D5C-GOTR-PACKE version F or later

- For details of the video input function and RGB input function, refer to the following manual.
  For GT Designer : GT Works Version□/GT Designer Version□ Reference Manual
  For GT Designer2 : GT Designer2 Version□ Reference Manual
- When using the A9GT-80V4R1 with the A985GOT-TBA-V, use the A985GOT-TBA-V of hardware version L (January, 2002) or later.

3.6 RGB Input (only for A985GOT-V)

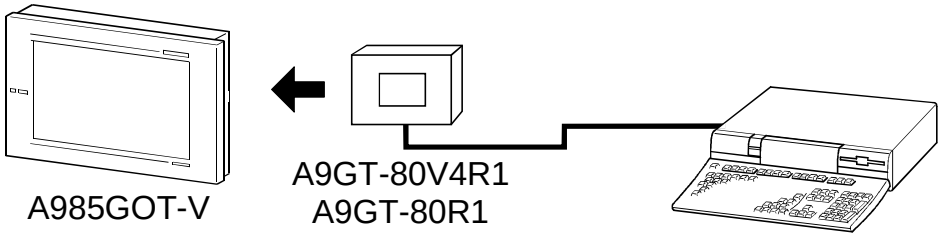
By mounting a video/RGB hybrid interface unit (A9GT-80V4R1) or RGB input interface unit (A9GT-80R1) to the A985GOT-V, a personal computer display can be shown on the GOT as an RGB screen.
Also, by using a RGB output type vision sensor, images taken with a video camera can be displayed on the A985GOT-V.
For details of the RGB screen, refer to the following manual.

- For GT Designer : GT Works Version□/GT Designer Version□ Reference Manual
- For GT Designer2 : GT Designer2 Version□ Reference Manual

For details of the system configuration, refer to the following manual.

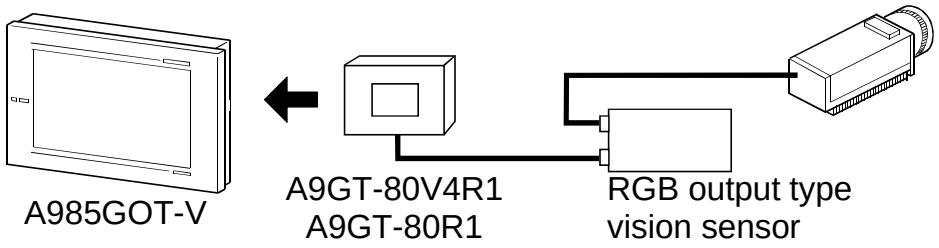
- GOT-A900 Series User's Manual (Connection System Manual)

When connecting to a personal computer



* You can not show the computer's display on the computer monitor and the A985GOT-V at the same time.

When using the RGB output type vision sensor and connecting to a video camera



(1) Display specifications

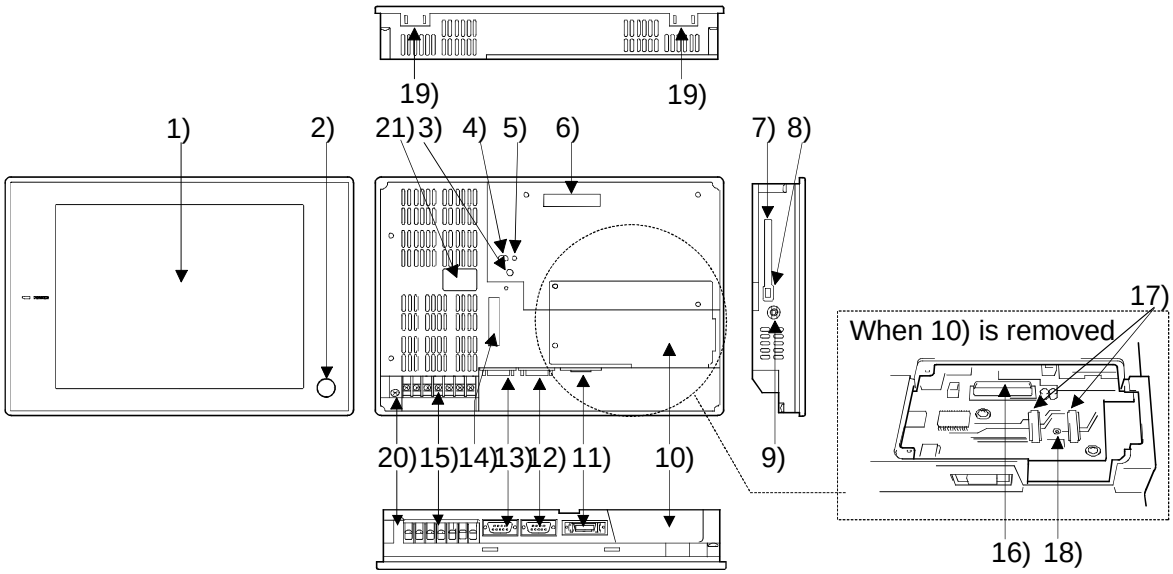
Item	Specifications
Image display color (color)	65536
RGB input format	Analog RGB (SVGA: 800 x 600, VGA: 640 x 480)
Number of video input channels	1 channel
Display size (mm)	800 x 600 or 640 x 480

- For details of the system configuration, refer to the GOT-A900 Series User's Manual (Connection System Manual).
- For details of the RGB screen, refer to the following manual.
  For GT Designer : GT Works Version□/GT Designer Version□ Reference Manual
  For GT Designer2 : GT Designer2 Version□ Reference Manual
- One of the following software package are required for A9GT-80R1, A9GT-80V4R1:

Type	Compatible software package	
	GT Works2 GT Designer2	GT Works GT Designer
A9GT-80V4R1	SW1D5C-GTWK2-E version A or later SW1D5C-GTD2-E version A or later	SW5D5C-GTWORKS-E version 26C or later SW5D5C-GOTR-PACKE version 26C or later
A9GT-80R1		SW5D5C-GTWORKS-E version J or later SW5D5C-GOTR-PACKE version J or later

- For details of the video input function and RGB input function, refer to the following manual.
  For GT Designer : GT Works Version□/GT Designer Version□ Reference Manual
  For GT Designer2 : GT Designer2 Version□ Reference Manual
- When using the A9GT-80V4R1 with the A985GOT-TBA-V, use the A985GOT-TBA-V of hardware version L (January, 2002) or later.

4. Names of the Parts

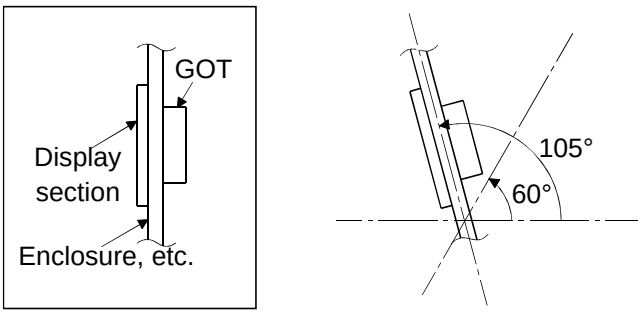


No.	Name	Description
1)	Display section	Shows the screen
2)	Operator detect sensor	Sensor that detects Operators
3)	Reset button	Used to reset the hardware of the GOT
4)	memory card access switch	Used to set the condition of access to the PC card when it is loaded during power-on (Factory-set to OFF) OFF : Access from GOT to PC card inhibited ON : Access from GOT to PC card enabled
5)	memory card LED	Indicates whether the PC card may be loaded/unloaded or not Off : PC card may be loaded/unloaded (When switch 3 is OFF) On : PC card must not be loaded/unloaded (When switch 3 is ON)
6)	Communication module interface	Interface for loading the communication module
7)	memory card interface	Interface for loading the PC card
8)	memory card ejection button	Button used to withdraw the PC card
9)	Speech output terminal	For external speaker connection
10)	Slot cover	Fixture to cover the slot
11)	Printer interface	For parallel printer connection
12)	CRT interface (for A985GOT only)	For CRT connection
	RS-232C interface (for A985GOT-V only)	For connection of personal computer and barcode reader
13)	RS-232C interface (for A985GOT only)	
14)	Option module interface	A985GOT-V:For video/RGB input module loading. A985GOT :For external I/O module loading.
15)	Terminal block	For power input and external output
16)	Communication board slot	Slot for communication board loading
17)	Memory board slot	Slot for memory board loading
18)	Screw hole for attaching memory board	Screw hole used to attach the memory board
19)	Mounting fixture fitting portion	For mounting fixture fitting
20)	Protective ground terminal	For earthing (For safety, please make sure to ground this terminal.)
21)	Rating plate	———

5. Handling

5.1 Handling instructions

When mounting the main unit to a control box or the like, set the display section as shown below.
When the temperature inside the enclosure is 40 to 55°C or less, the mounting angle should be in the range 60 to 105 degrees.



The GOT will be deteriorated earlier if it is used at the mounting angle other than the above. Therefore, the temperature inside the enclosure should be within 40°C.

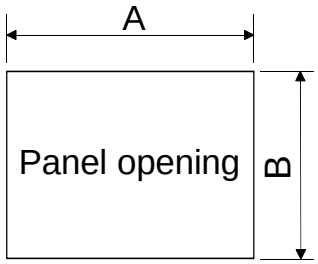
Tighten the screws in the following specified range.

Screw Location	Tightening Torque Range
Protective ground terminal screw	82 to 110N•cm
Terminal block terminal screw (M3 screw)	59 to 88N•cm
Mounting fixture screw (M4 screw)	36 to 48N•cm
Communication module mounting screw (M3 screw)	
Communication board mounting screw (M3 screw)	
Option module mounting screw (M3 screw)	
RS-232C connector mounting screw (M3 screw)	
SVGA type CRT mounting screw	
Case fixing screw (M3 screw)	
Memory board mounting screw (M2.6 screw)	25 to 35N•cm

5.2 Installation method

(1) Mounting panel cutting dimensions

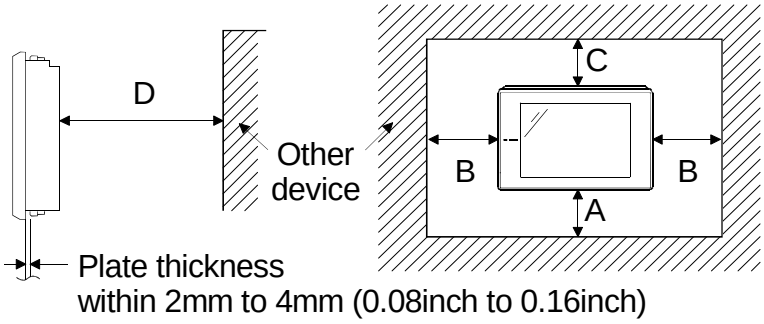
When mounting the GOT on a control box door, user-made mounting base or the like, the door or mounting base must be cut as indicated below.



Type	A [mm](inch)	B [mm](inch)
A985GOT(-V)	302 (11.89) [+1.0(0.04), –0(0)]	228 (8.98) [+1.0(0.04), –0(0)]

(2) Mounting position

When mounting the GOT, the following clearances must be left from the other device.



Part A size: As the GOT connection cable is led out downward, the following clearance must be provided in consideration of the bending radius.

Item	A [mm] (inch)
A985GOT(-V) + Communication board	140 (5.51) or more
A985GOT(-V) + A9GT-BUSSU/BUS2SU	30 (1.18) or more

When using a cable prepared by user, please consider the connector cover to be used and the bending radius of the cable.
When using a bar code reader, please consider the dimensions of the connector to be used and the bending radius of the cable.

Part B size: When using the PC card or audio output, a clearance of 100mm (3.94 inch) or more is required to lead out the cable and to mount or remove the PC card. (A clearance of 50mm (1.97 inch) or more is required when these are not used.)

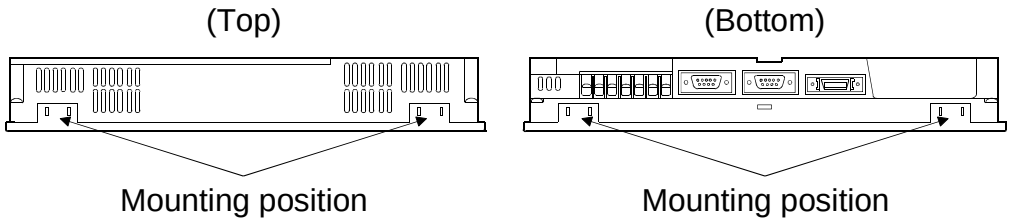
Part C size: Please allow a gap 80mm (3.15inch) or more from the structure and other equipment in the upper part of the unit to often allow good ventilation.

Part D size: When installing a device that generates radiation noise (contactor, etc.) or a device generating high levels of heat near the GOT, provide a clearance of 100mm (3.94 inch) behind the module to avoid the effect of the noise and heat.

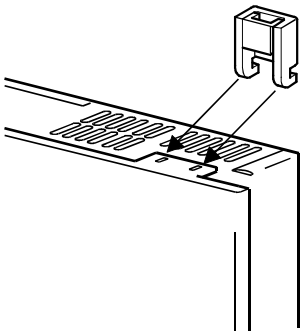
(3) Mounting method

(a) Put the GOT main unit into the panel opening, with its front face first.

(b) Mount the GOT in the following four locations at its top and bottom.



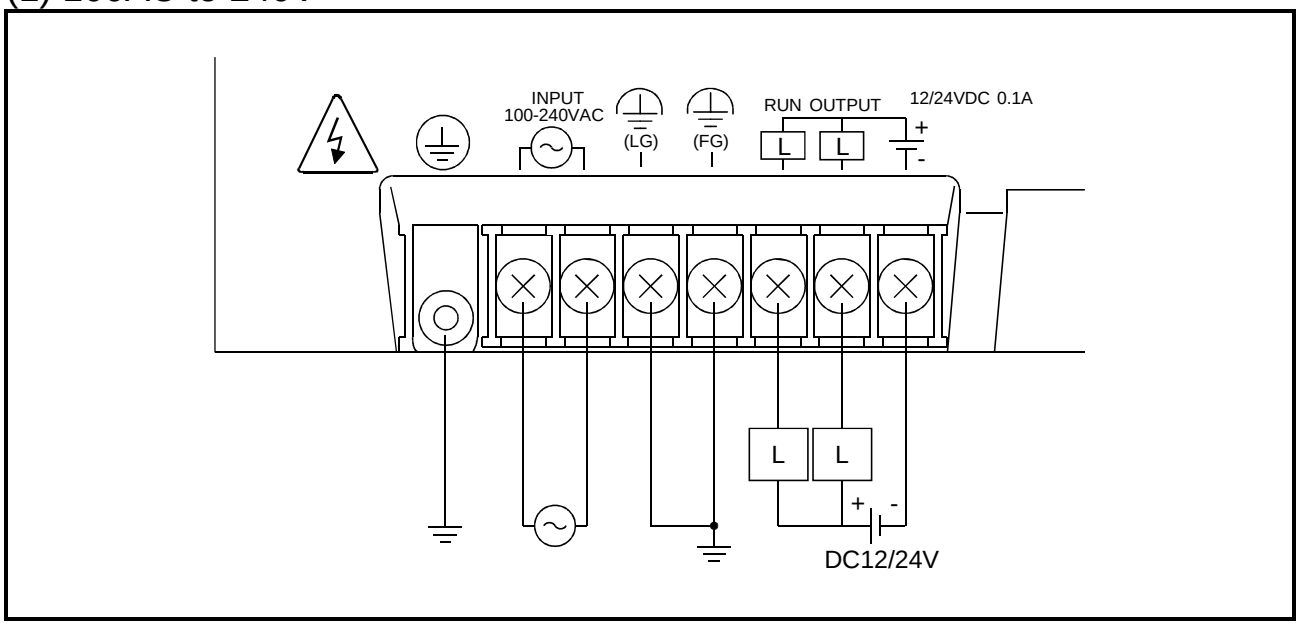
(c) How to mount and fix the mounting fixture is given below.



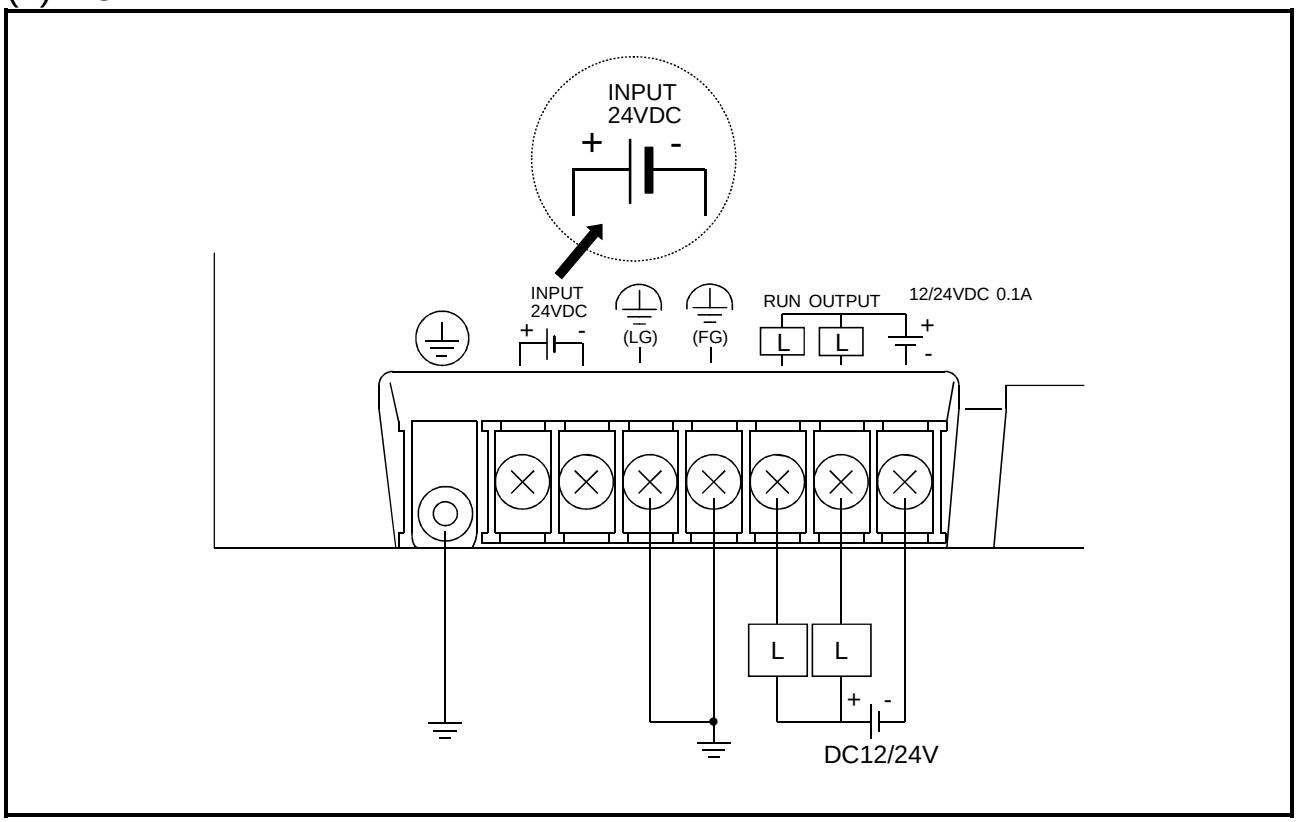
1) Insert the mounting fixture into the fixture fitting portion of the GOT main unit.
2) Tighten and fix the mounting screw in the specified torque range. (Overtightening may distort the panel and crimp the protective sheet.)

5.3 Wiring diagram

(1) 100AC to 240V



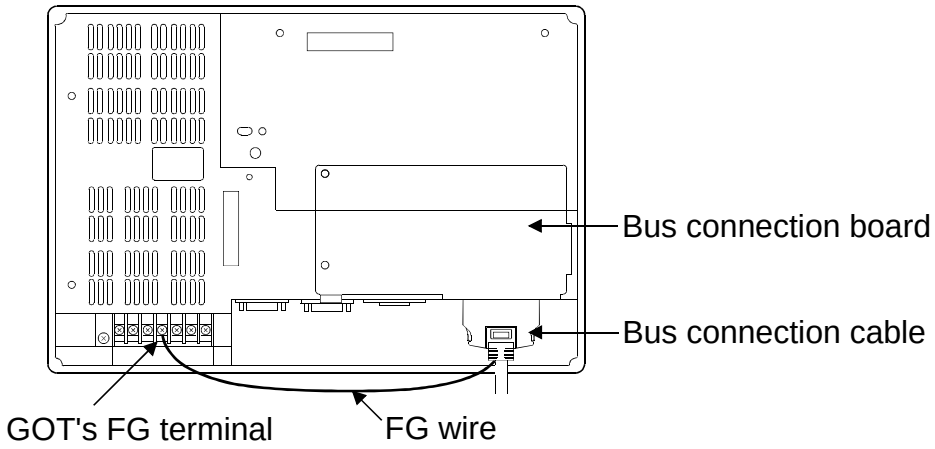
(2) DC24V



*1 For application of external outputs of RUN OUTPUT, please refer to the [A985GOT/A975GOT/A970GOT/A960GOT User's Manual].

*2 When using a bus connection board or bus connection unit and connecting the ACPU and via the bus connection, and when using A8GT-C100BS/C200BS/C300BS or A8GT-C100EXSS/C200EXSS/C300EXSS bus connection cables, shorten the cable's FG wire (green wire) as much as possible, then connect to the FG terminal of the GOT and sequencer's power module.

Example) When using a bus connection board



*3 When attaching GOT, always ground the LG and FG terminal.

5.4 The Precautions on the Wiring

⚠ DANGER

- Completely turn off the externally supplied power used in the system when installing or placing wiring. Not completely turning off all power could result in electric shock, damage to the product.

⚠ CAUTION

- Be sure to ground the FG terminal and LG terminal of the GOT power supply section to the protective ground conductor. Not doing so could result in electric shock or erroneous operation.
- When wiring in the GOT power section, be sure that it is done correctly by checking the product's rated voltage and the terminal layout. Connecting a power supply that is different from the rating or incorrectly wiring the product could result in fire or erroneous operation.
- Tighten the terminal screws of the GOT power supply section within the specified torque range.
  If the terminal screws are loose, it could result in short circuits, erroneous operation or erroneous operation.
  Tightening the terminal screws too far may cause damages to the screws and/or the module, resulting in fallout, short circuits, or erroneous operation.
- Be sure there are no foreign substances such as sawdust or wiring debris inside the modle GOT main unit.

• General view of noise countermeasures

There are two types of noise: radiated noise, which is transmitted through the air, and conducted noise, which is transmitted through a connection wire. In noise countermeasures, the both two types of noise should be taken into account. As the noise countermeasures, there are the following three methods.

(1) Block noise
  (a) Keep signal wires away from a possible noise source as power wires or high-power driving circuits.
  (b) Shield signal wires.

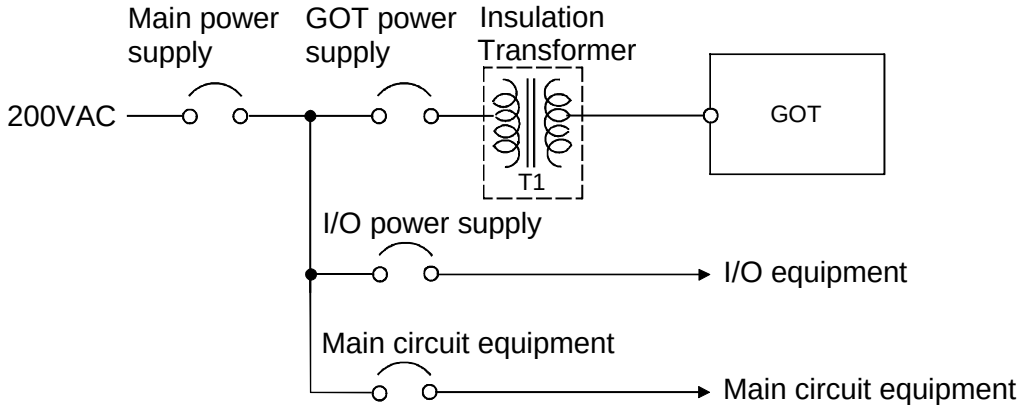
(2) Reduce generated noise
  (a) Reduce the noise generated from high-power motor drive circuits.

(3) Ground noise without fail
  (a) Earth the grounding wire to the ground without fail.
  (b) Use a grounding wire as thick and short as possible to ensure low grounding impedance.
  (c) Separate the grounding between power and control systems.

(1) Power supply wiring

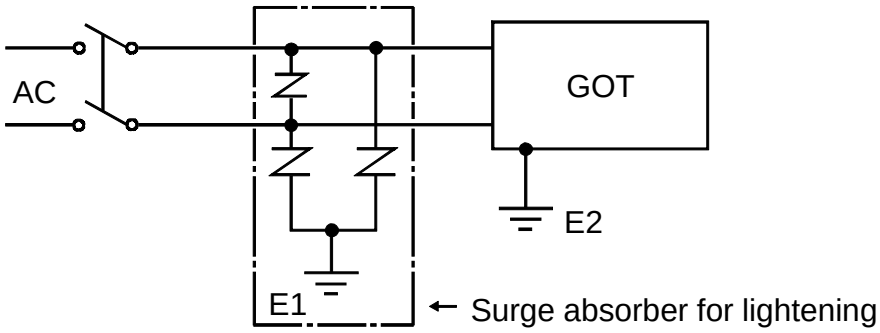
- Separate the GOT's power supply line from the lines for I/O devices and power devices as shown below.
  When there is much noise, connect an insulation transformer.

Power supply wiring diagram



- 100VAC, 200VAC and 24VDC wires should be twisted as dense as possible.
  Connect the modules with the shortest distance.
  Also, to reduce the voltage drop to the minimum, use the thickest wires possible (0.75 to 2mm^2).
  Use a solderless terminal for M3 screw. Also, be sure to tighten the M3 screw within tightening torque 0.55 to 0.88 N•m in order not to cause trouble.
- Do not bundle the 100VAC, 200VAC and 24VDC wires with, or run them close to, the main circuit (high voltage, large current) and I/O signal lines. Reserve a distance of at least 100 mm from adjacent wires.
- As a countermeasure to power surge due to lightening, connect a surge absorber for lightening as shown below.

Lightening surge absorber connection diagram

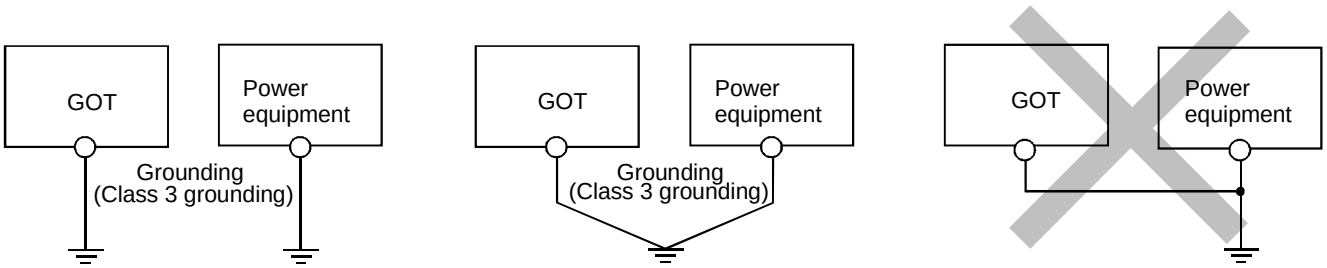


POINT

(1) Separate the ground of the surge absorber for lightening (E1) from that of the GOT (E2).
(2) Select a surge absorber for lightening whose power supply voltage does no exceed the maximum allowable circuit voltage even at the time of maximum power supply voltage elevation.

(2) Grounding

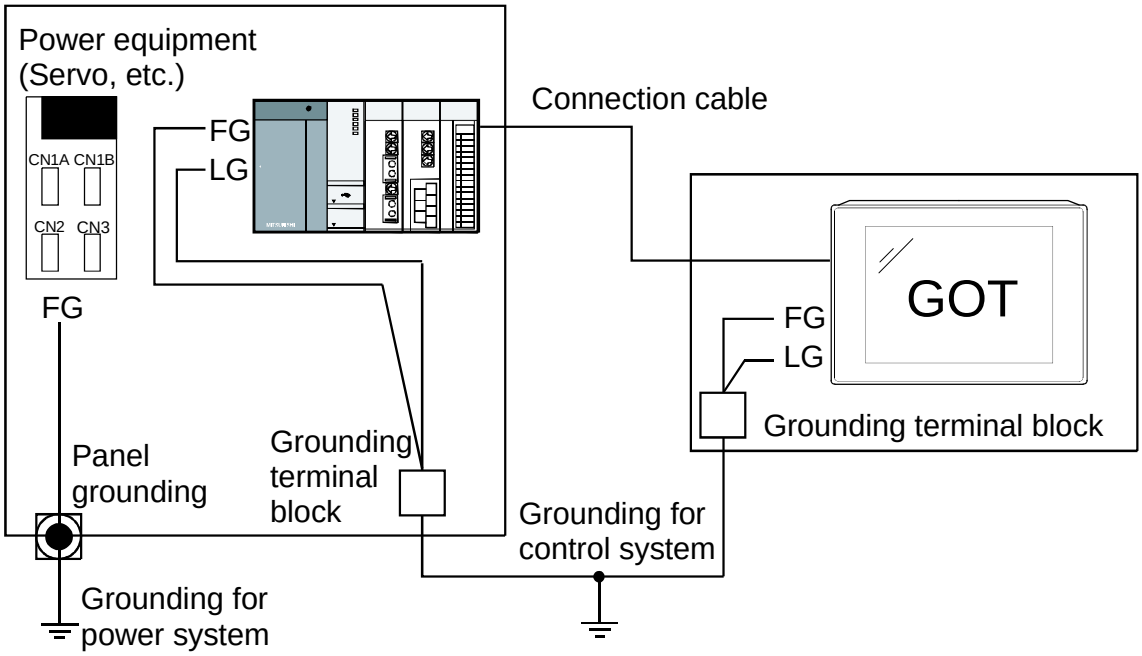
- For grounding, perform the following:
  Use a dedicated grounding wire as far as possible. (Grounding resistance of 100Ω or less.)
- When a dedicated grounding cannot be performed, use (2) Common Grounding shown below.
  Also, be sure to take noise countermeasures other than grounding.



(1) Independent grounding····· Best (2) Common grounding····· Good (3) Joint grounding···· Not allowed

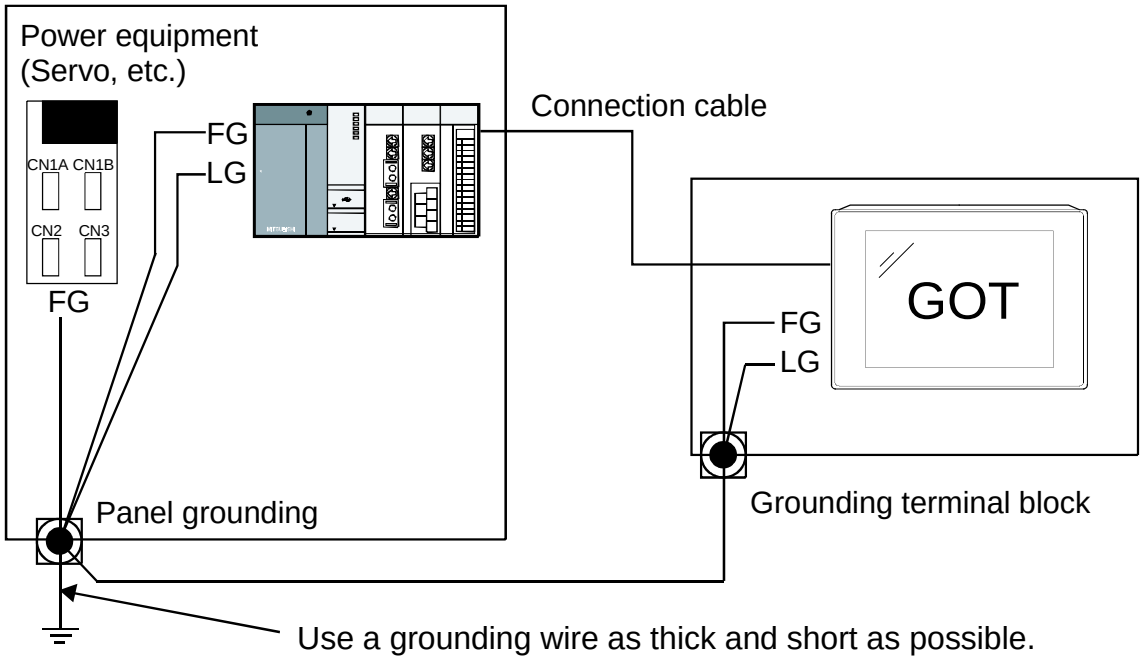
- For grounding a cable, use the cable of 2 mm^2 or more.
  Position the ground-contact point as closely to the sequencer as possible, and reduce the length of the grounding cable as much as possible.

(a) An example of independent grounding



* For control system grounding, apply single-point grounding for one system.
Especially for the devices communicating each other, be sure to earth the grounding wire at one point.

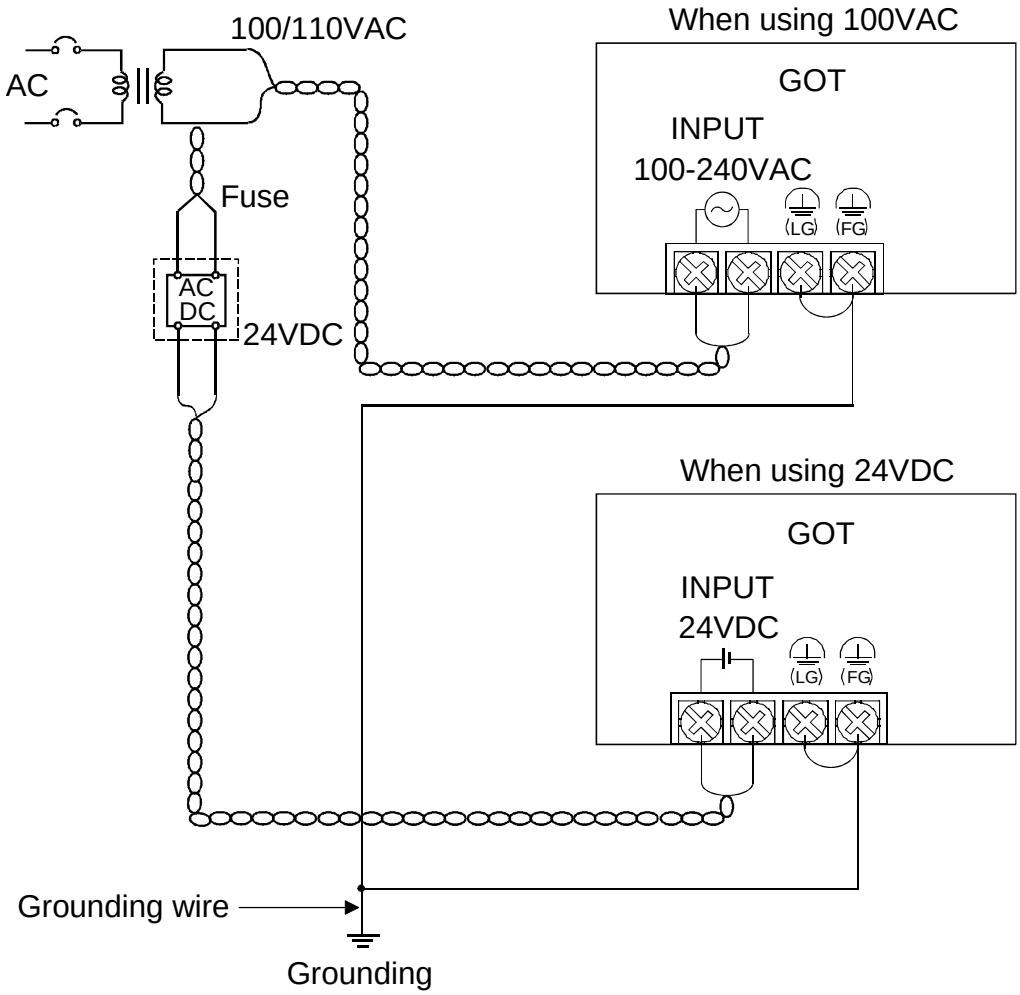
(b) An example of common grounding



* Apply single-point grounding for one system.

5.5 Connecting to the GOT Power Section

The following diagram shows the wiring example of power lines, grounding lines, etc. to the GOT power section.



POINT

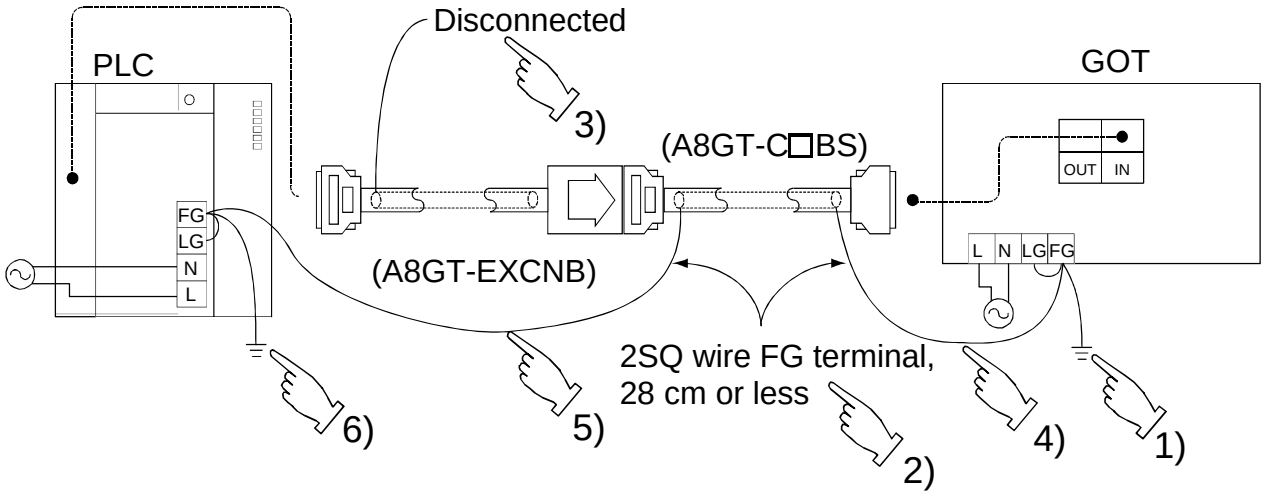
(1) Use the thickest possible (max. 2 mm^2 (14 AWG)) wires for the 100/200 VAC and 24 VDC power cables. Be sure to twist these wires starting at the connection terminals. To prevent a short-circuit should any screws loosen, use solderless terminals with insulation sleeves.

(2) When the LG terminals and FG terminals are connected, be sure to ground the wires. Do not connect the LG terminals and FG terminals to anything other than ground. If LG terminals and FG terminals are connected without grounding the wires, the PLC may be susceptible to noise.
In addition, since the LG terminals have potential, the operator may receive an electric shock when touching metal parts.

5.6 Connection Cable Wiring

- Do not bind connection cables with the main circuit (high voltage, heavy current) or I/O signal cables, or lay them close to each other.
- When using A8GT-C□EXSS-1 or A8GT-C□BS, ground wires as below.

(1) When using A8GT-C□EXSS-1 cable



1) Connect the LG and FG terminals of GOT unit power to the ground through the terminal block with one wire.
2) Use FG wires of 28 cm or less for the A8GT-C□BS cable.
3) Do not connect the FG grounding wire of A8GT-EXCNB cable.
4) Connect the A8GT-C□BS cable's FG wire to FG of the GOT unit power terminal block.
5) Connect the A8GT-C□BS cable's FG wire on the PLC side to FG of the PLC power supply module.
6) Connect the LG and FG terminals of the terminal block on the PLC to ground with one wire.

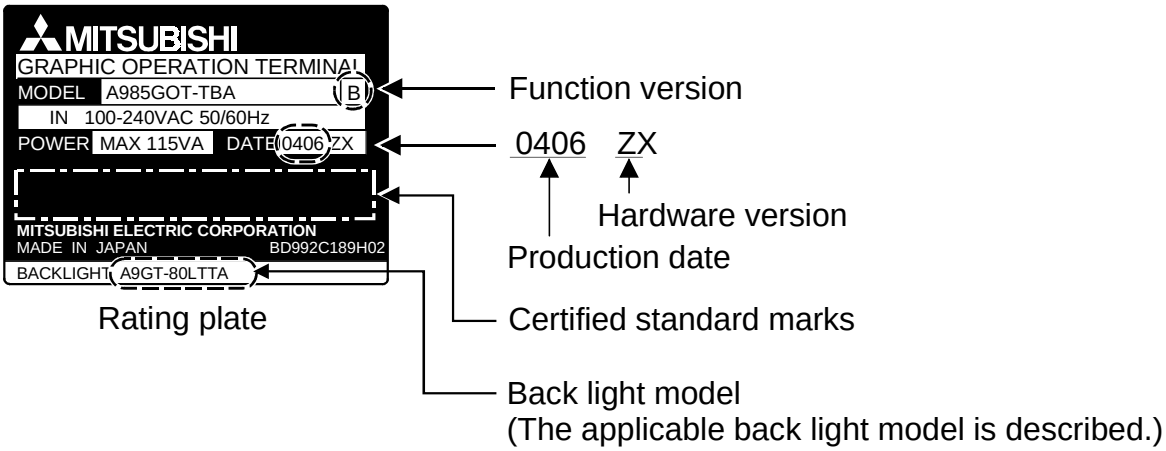
(2) When using A8GT-C□BS cable
Connect the A8GT-C□BS cable's FG wires on the both sides to the FG terminals on the power terminal block of the both side GOTs.

5.7 Precautions for back light replacement

Use the following back lights for the GOT that includes this manual.

Type	Model	Replacement back light
A985GOT-V	A985GOT-TBA-V (Function version B (JUN.,2004) or later), A985GOT-TBD-V (Function version B (JUN.,2004) or later)	A9GT-80LTTA
A985GOT	A985GOT-TBA (Function version B (JUN.,2004) or later), A985GOT-TBD (Function version B (JUN.,2004) or later)	A9GT-80LTTA

The GOT hardware version and function version can be checked from the rating plate, which is situated on the backside of the GOT.

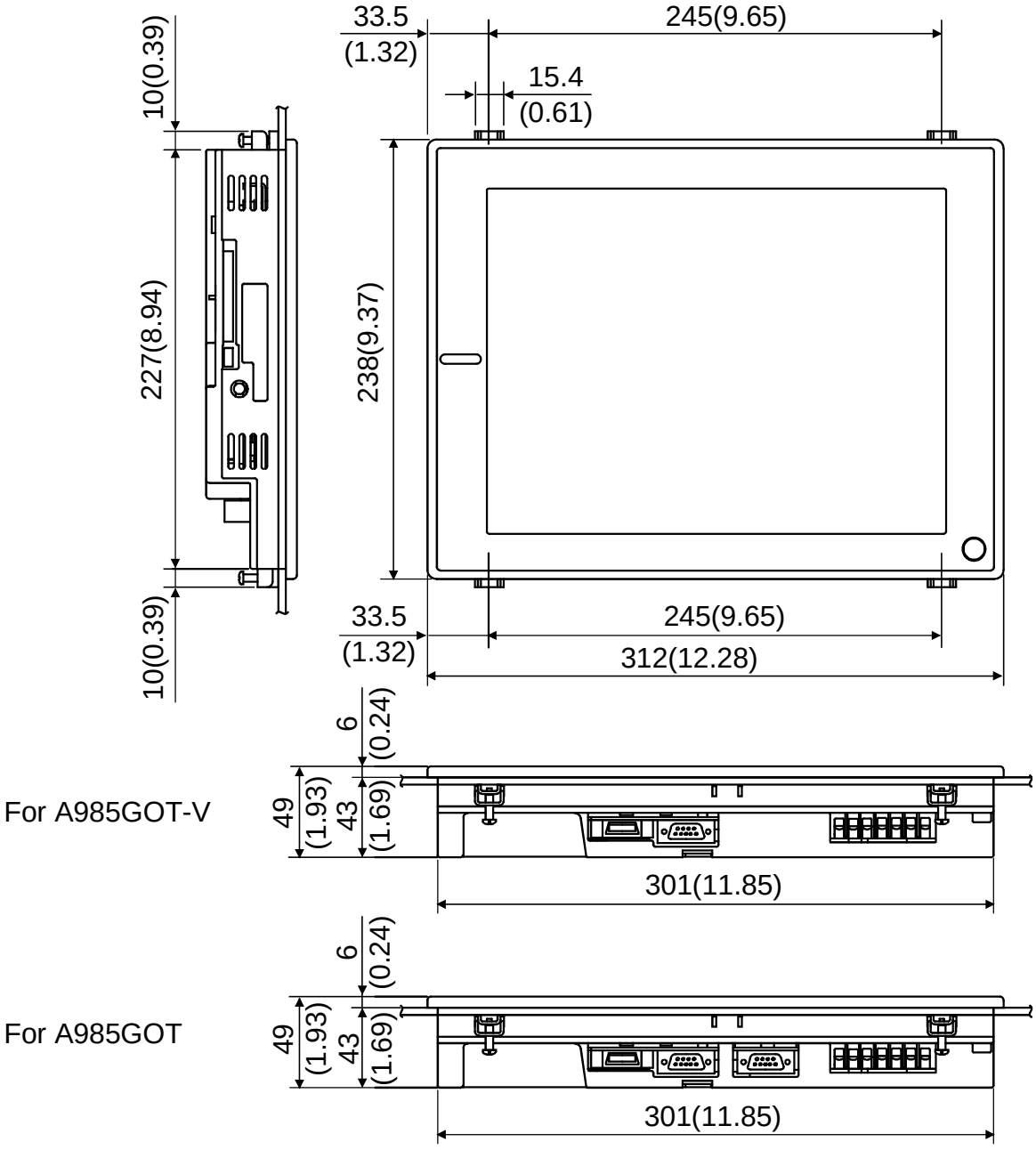


The applicable back light differs with the GOT hardware version and function version.

For more information, refer to A985GOT/A975GOT/A970GOT/A960GOT User's Manual.

Appendices

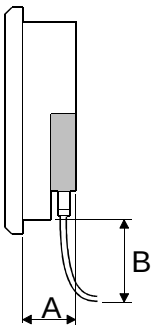
Appendix 1 External dimensions



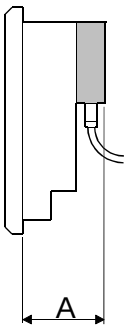
Unit: mm (in.)

Appendix 2 Depth dimension for when mounting each type of unit

Communication board mounting



Communication unit/Oprion unit mounting



Installed communication unit	A[mm] (inch)	B[mm] (inch)
A9GT-QBUSS, A9GT-BUSS	43(1.69)	100(3.94)
A9GT-QBUS2S, A9GT-BUS2S	65(2.56)	100(3.94)
A9GT-BUSSU, A9GT-BUS2SU	85(3.35)	105(4.13)
A7GT-J71AP23, A7GT-J71LP23, A9GT-QJ71LP23	77(3.03)	*1
A7GT-J71AR23, A7GT-J71BR13, A9GT-QJ71BR13	77(3.03)	*2
A7GT-J71AT23B	99(3.90)	-
A8GT-J61BT13, A8GT-J61BT15	82(3.23)	-
A9GT-J71E71-T	73.2(2.88)	-
A9GT-70KBF	85.6(3.37)	-
A9GT-80V4, A9GT-80R1, A9GT-80V4R1	86(3.39)	-

*1 This dimension is between 195mm (7.68) maximum and 80mm (3.15) minimum depending on the optional fiber cable and connector connected.

*2 This dimension is between 80mm (3.15) maximum and 73mm (2.87) minimum depending on the coaxial cable connected.

Warranty

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; machine damage or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

⚠For safe use

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi.
- This product has been manufactured under strict quality control. However, when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

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